



COMPOSTING PERSPECTIVES

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Put Poultry Litter Problems to Bed

Reduce ammonia and pathogens with humified compost

Broiler chick production in the United States has steadily increased since 1975. With this increase in hatchery production has come an increase in hatchery waste. To dispose of this



hatchery waste, producers have tried methods ranging from landfill and land application to rendering and egg wringing. However, producers are now beginning to recognize new composting technology as a welcome alternative. This state of the art technology converts nitrogen-rich hatchery waste into a valuable soil amendment and organic fertilizer (see article, page 4).

There are many benefits to using compost-based bedding that traditional methods of poultry bedding do not offer. At Midwest Bio-Systems we have developed a processing system that combines the unique properties of humified compost (compost with higher amounts of humus) with specialized minerals and wood shavings to produce the ultimate poultry bedding that suppresses pathogens and reduces ammonia in the barn. By reducing ammonia, this bedding produces dryer floors

and better feed conversion, resulting in a lower mortality rate. Also, with reduced ammonia levels, much less heating and air circulation is required. Thus, by introducing compost bedding to poultry operations, producers are able to reduce overhead while creating a cleaner growing environment and producing healthier broiler chicks.

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Compost use in poultry bedding has previously been a slow spreading concept, mainly because early experiments with the process were conducted by poultry producers themselves. Large poultry processing operations were concerned about potential transfer of diseases from one operation to another — a legitimate concern, since compost used for bedding often does contain spent poultry litter. Awareness of these concerns has led many compost bedding producers to be stricter about tracking what materials go

(See "Bedding," next page)

Bedding *(Continued from page 1)*

into their bedding compost and to use processes that keep different types of compost completely separate.

If you are in the compost business and are interested in marketing your product to poultry producers, you should be careful to address the issue of disease spread initially and directly with your potential clients in order to lay their concerns to rest. If you are the bedding provider, but also offer services to clean out spent litter, assure your client that either separate equipment will be used to haul away spent litter, or that equipment used is adequately cleaned and sanitized before being used to bring in fresh bedding compost.

Using this processing system can help you:

- Control Ammonia
- Suppress Pathogens
- Produce Dryer Floors
- Get Better Feed Conversion
- Experience Fewer Mortalities
- Simplify Ventilation Strategy

On a related note: Eggshells from the poultry barn make an excellent additional input to the compost pile when treated properly, as with Midwest Bio-Systems' Advanced Composting System.



Seven Steps to Healthier Poultry

Midwest Bio-Systems' Safe Poultry Bedding System leverages the unique properties of humified compost and specialized microbes to produce poultry bedding that suppresses pathogens and reduces ammonia in the barn.



Step 1: Remove the old litter and level the floor



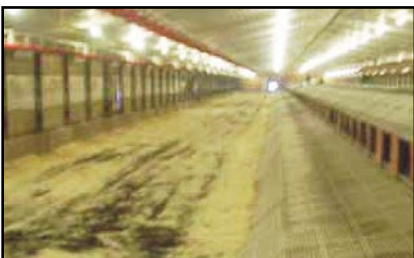
Step 2: Cover the floor with shavings — *Once the barn floor has been smoothed, cover it with wood shavings.*



Step 3: Separately prepare the Compost Mineral Blend — *The Safe Bed Compost Blend is prepared by combining key minerals with high quality humified compost in predetermined ratios.*



Step 4: Blend the Humified Compost with the minerals — *Use an Aeromaster compost windrow turner to get the best results while blending your windrows.*



Step 5: Spread the Safe Bed Compost Blend evenly over the shavings at a predetermined rate.



Step 6: Spray on Safe Bed Microbial Inoculant
Spray the Safe Bed Microbial Inoculant evenly over the shavings and compost. It is also recommended that any part of the barn that the chicken flock comes in contact with be sprayed with Safe Bed Microbial Inoculant.

Step 7: Bring in the birds!

Poultry Litter:

Opening the Fertilizer Tool Box

by Brad Mormann and Grant Woods, Ph.D — Excerpted with permission from Quality Whitetails

[This article shows an often-overlooked market for high-value humified compost. References to humified compost apply whether the feedstock includes poultry litter or not. We share it with you to give you one new revenue idea.]

Poultry litter is proclaimed as being the greatest manure fertilizer. Poultry litter is made up of poultry manure and bedding material (wood shavings, shredded paper, etc.). The nutrient content of the litter is highly dependent on the type of bedding material, litter type (broiler chicken, egg laying chicken, turkey litter), and the poultry's diet. These elements combine wonderfully to make up many of the necessary nutrients for plant fertilization.



Poultry litter contains the major macronutrients nitrogen (N), phosphorus (P), and potassium (K). Additional micronutrients include magnesium, manganese, boron, zinc and sulfur. The exact amount of each nutrient in poultry litter is highly dependent on the type of poultry that created it. Egg laying poultry litter tends to have a higher pH than broiler litter due to calcium added to their feed. Both litter types however primarily contain a basic pH (> 7.0 pH) that neutralizes soil pH following litter application.

Once determining that poultry litter is your best option, the first step is to learn what type of poultry litter may be available locally. Depending on state regulations and individual poultry producers, litter can arrive at your door step as **raw litter**, **composted litter**, or **humified composted litter**.

Raw poultry litter is litter that has not gone through any type of heat treatment to remove potential undesirable bacteria, pathogens, or weed seeds. Even though raw litter poses risks for the spread of poultry disease, this risk is slight due to the poultry industry's huge advances in disease suppression. The advantage of raw poultry litter is its high concentration of nutrients.

Composted poultry litter is litter that has been removed from a poultry facility and piled. While piled, chemical and microbial reactions generate a significant amount of heat. In fact, it produces enough heat that most of the harmful pathogens and weed seeds are killed. It should be understood, however, that there are varying degrees of composting. In particular, some states such as Louisiana require that all poultry litter be composted before spreading. This process is merely the piling of litter instead of spreading immediately after removing from the poultry facility.

Humified composted poultry litter is the most intensive litter management program. Raw litter is placed in long piles where it is continually mixed to ensure all litter has reached sufficient temperatures to remove pathogens and weed seed viability. In addition, the increased duration of time it is processed serves to break down the organic matter into humus. Humus is the transitional substance between organic matter and soil creation. Many beneficial bacteria and earthworms thrive in humus. Their presence is essential for the breakdown of organic nutrients into plant available inorganic nutrients such as N, P, and K. These bacteria include rhizobium that are the nitrogen "fixing" agents that make legumes like soybeans so high in protein! The only downside to the composting process is the loss of a percentage of the nitrogen and phosphorus to denitrification, leaching, and runoff, depending on the processes used.

One of the best ways to increase your food plot quality while reducing cost is knowing how much fertilizer to apply. This can only be accomplished by taking soil samples from each food plot as well as testing the poultry litter that will be spread to determine its nutrient content. Please refer to QDMA's Quality Food Plots book for an accurate description of soil sampling and testing. After reviewing the soil and litter test results and the lab's recommendations of how many pounds of N, P, and K are necessary to add to produce the desired crop, the correct tonnage of poultry litter can be calculated and applied. Since poultry litter can have a range of nutrient availability, be sure to utilize a test from litter that will be used.

Application timing is critical to insure that nutrients are used by food plot plants. Depending on the type of food plot, cool season or warm season, the time of year is not as important as the proximity to planting. For instance, if planting winter wheat in a previously unfertilized food plot, apply poultry litter immediately before planting. This is especially important because approximately 10% of the N in the litter will be in the form of nitrate or ammonium. Both are inorganic forms of N that are ready for plant uptake. If not promptly utilized denitrification will occur. Denitrification is the reduction of nitrate and nitrite (plant friendly N) to gaseous N that is far less available to plant uptake. The majority of the remaining N will be slowly released throughout the growing season to continuously feed the wheat's N needs.



Another beneficial characteristic of poultry litter is pH buffering. In most cases, especially highly acidic soils, poultry litter neutralizes the soil. Through repeated applications, a pH of 7.0 is in reach of nearly any soil. Spreading poultry litter is like fertilizing and liming in one pass, with only one bill. Mineral fertilizer, on the other hand, is acidic. As a result, liming is required on a continual basis to maintain a neutral pH.

Lastly, we mentioned that poultry litter is largely composed of organic matter. Organic matter is essential to building soil structure. Good soil structure creates adequate aeration for plant roots and a home for microbes. Microbes are the code crackers of organic soil nutrients changing them into plant available inorganic nutrients. In addition, we cannot forget that **humified composted poultry litter** increases a soil's water holding capacity. With the ability to absorb several times its weight in water, this can literally carry a food plot through periods of drought.

Mineral fertilizer prices are intricately linked to petroleum costs because petroleum is used in their production and shipping. As demand for fossil fuels throughout the world drives petroleum prices upward, mineral fertilizer prices will not be far behind. This has forced wildlife managers to search for alternative sources of plant nutrients to feed their food plot acreage. The use of poultry litter can have its greatest effects on nutrient poor, sandy, and acidic soils; which are prevalent on most hunting properties. In just one pass a poultry litter spreader can improve: soil water and nutrient holding capacity; pH; soil structure and aeration; and microbe production. All this while minimizing soil compaction and expenses. Think ahead before the next planting season to get your name on the poultry producers litter list!

Looking to grow your revenues?

BioCycle goes online to help you Find A Composter



BioCycle Magazine launched a data base in 2007 called ***findacomposter.com*** to assist generators of organic waste streams and purchasers of compost in North America to find composting facilities in their area. There is no charge to have a composting facility listed, nor is there a fee to search the database.

“We started www.findacomposter.com for several reasons,” says Nora Goldstein, Executive Editor of *BioCycle*. “First, there was not a publicly searchable database of composting facilities available, and we felt it was very important to have a centralized database with easy and no-cost access. Second, there is growing interest on the part of

generators of clean organic waste streams to divert those materials to composters, and we believe that the database facilitates their search for facilities — and in general, reinforces the fact that there is a substantial and growing composting industry.”

To enter a facility into the database, go to ***www.findacomposter.com***, and click on “Add Facility.” Once information is entered, *BioCycle* staff verifies the data and then approves the listing for addition to the database. In June, additional search features will be added, including proximity and feedstock searches.

Customers in the news...

Self-sustaining county composting site in Ellensburg, WA

Kittitas County Solid Waste Division uses Midwest Bio-Systems equipment at their composting facility and was recently featured in BioCycle Magazine. Reprinted with permission from BioCycle Magazine, www.biocycle.net

Kittitas County Solid Waste Division is constructing a yard trimmings composting facility that should be self-sustaining on tip fees and compost sales. Besides yard trimmings, clean lumber and straw bedding will be composted. Last year, 2,000 tons of yard trimmings were dropped off for processing.

“The facility is being designed to handle 6,000 tons of waste,” says Patti Johnson, Director of Kittitas County Solid Waste. The \$1.5 Million needed for the composting facility is being funded by a grant from the Department of Ecology and existing Solid Waste reserve funds. The facility should be up and running in a few months, with composting prices determined by operating costs.

Reduce Expenses and Generate Income

Using the Advanced Composting System

Quality compost impacts both soil and growing plants. Compost produced using Midwest Bio-Systems' Aeromaster windrow turners, equipment and methods can both **reduce expense** and **generate extra income**.



Reduce Composting Expenses

- Fuel savings
- Time and expense for labor
- Environmental risk minimized as nutrients held in stable form, resistant to leaching into groundwater
- More efficient space usage
- Shorter time to market
- Turn and water in one pass

Reduce Agricultural Expenses

- Erosion resistance (wind/water)
- Electricity saved from pumping
- Water use reduced (improved retention in soil)
- Irrigation savings
- Water available from sub surface
- Reduced soil compaction
- Improved root systems
- Reduced need for inputs
- Pesticides/insecticides
- Herbicides
- Fertilizers (as soil health improves)
- Access last year's unused fertilizers
- Improved residue decomposition from last crop cycle
- Salt levels lowered (nutrient balancing occurs)
- Soil conditioning additives reduced (gypsum, lime, etc.)
- Pollutants remediated by microbes
- Buffering capacity reducing moisture & pH stresses

Create Additional Income

- Nutrient value (N-P-K & trace elements)
- Nitrogen fixing bacteria
- Humate value of humus for soils Increased yields
- 10 to 40 percent larger/heavier plants, nuts, fruits, flowers, kernels, & produce
- Reduced loss due to disease
- Reduced loss due to insects
- Plants using nutrients previously tied up or lost to weed pressure
- Improved germination rates
- Increased resistance to drought, better appearance, better sales, improved storage or shelf life

Results may vary according to current soil needs, type of crop to be grown, weather, and other management practices.



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"I have attended five other composting workshops and seminars. The Midwest Bio-Systems seminar has given me the most answers to my technical questions."

"This is a system that works! I came away knowing how to do it!"

WORKSHOPS

Composting Workshops from Midwest Bio-Systems provide thorough training in the best methods for converting agricultural waste and organic matter into highly effective organic fertilizer.

If you're interested in coming to a workshop, let us know!

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